MODIS Technical Team Meeting
Thursday, February 27, 2003
1 P.M., GSFC Building 33, Room E125

Vince Salomonson chaired the meeting. In attendance were Dorothy Hall, Jack Xiong, Steve Kempler, Ed Masuoka, Thomas Pagano, George Aumann, Mous Chahine, Gerhard Meister, Wayne Esaias, Eric Vermote, Robert Wolfe, Chris Justice, Shaida Johnston, and Bill Barnes, with Yolanda Harvey taking the notes.

1.0 Upcoming Events

- Data Products Review March 10-11, 2003
- Ocean Color Meeting, April 15-17, 2003, Miami, Florida, USA.
- IGARSS 2003, July 21-25, 2003, Toulouse, France (abstracts deadline past). http://www.igarss03.com/
- 10th International Symposium on Remote Sensing by The International Society for Optical Engineering (SPIE). September 8-12, 2003, Barcelona, Spain (abstracts deadline past). http://www.spie.org/info/rs

2.0 Meeting Minutes

2.1 General Discussion

The meeting started with a presentation by Thomas Pagano, George Aumann, and Mous Chahine (all from NASA JPL) on the proposed MIRIS instrument as a combined AIRS/MODIS follow-on. Pagano explained that MIRIS should be a cost effective, relatively small, higher performance instrument combining the very positive attributes of AIRS and MODIS. He has been working on the concept since 1998 and wanted to get some feedback on it from the MODIS team. Pagano presented MIRIS key characteristics:

- It will be totally infrared, with 1024 spectral channels in the 3.7 to 15.4 micrometer range. Its spatial resolution would be less than 1km, in essence, regional MODIS and AIRS capability (but with reduced coverage, +/- 8 degree). Essentially, MODIS refractive technology and AIRS grating technology would be used to create MIRIS.
- It will use a push-broom method, with >256 pixels cross-track, 0.56 km, > +/- 5.8 degrees, 83 ms dwell time, R=1000. Spatial resolution in one direction, spectral in the other.
- It will have the same kind of field of view (FOV) as Landsat (about 15 degrees). Using a fold mirror will allow pointing the FOV about 45 degrees off nadir side to side. Also, it can point front to back.
- One option is for the instrument to fly in a 10,000 km medium-earth orbit that minimizes the radiation load. Higher orbits give smaller pointing angles and better coverage but require larger apertures. They are considering using inclined rotation to give better coverage, but that will produce longer revisit times. Orbits exist to optimize coverage, and they expect to revisit an area 1-4 times daily, with up to 9 scans of 2K by 2K image.

Pagano noted that the technology development is already in place, so the technical cost/risk is minimal because NASA has already invested a lot in this technology.

Esaias asked if it is not continuous coverage, how people would decide what to look at, and Pagano said that because that is an operational issue, locations would have to be

programmed in ahead of time. Salomonson observed that the technology is exciting, but further clarification is needed with regard to what it would do scientifically. The resolution would be good for fires, for looking at the composition of smoke, smoke plumes, temperatures, water vapor dynamics, the atmospheric environment around mesoscale storms, etc. He suggested that one could start with the fact that there is a process diagnostic capability, and it would have to be made complementary with wide-swath routine coverage. Vermote asked about calibration, cross-talk, etc., and Pagano said that there is technology in the works that may allow them to avoid calibrating so often, but that there are some issues in calibrating with the push-broom method. He would want much longer times between calibrations. Pagano also emphasized that MIRIS wouldn't be a replacement of NPOESS VIIRS/CRIS in any way, and that at this point it is still just an idea.

Salomonson showed a number of slides that he was planning to use in his presentation for the MODIS Data Products Review, and solicited the group's feedback before he presented. His presentation would be an overview of the status of MODIS efforts with additional focus on the instrument performance and the Level 1 products.

Salomonson said he would also note that there are a substantial number of MODIS Direct Broadcast facilities worldwide, and progress has been made in releasing MODIS code for use at DB stations.

Justice observed that getting all the bugs out of the systems processing MODIS data has been a real accomplishment, and Esaias agreed, and added that the MODIS teams have worked very hard to get products out so fast and at such a high volume. Justice wondered whether there are any others that are processing such a large amount of data so well, and Masuoka replied that he's not sure about that, but that there are substantial justifications for being proud that we're working smoothly at the levels we agreed to. Justice also noted that it should be understood that it takes at least a couple of years of good data to start getting good science results. Hall noted that data access is getting a lot better because of all the effort that has been put into it. Esaias said that he would be devoting a few slides of his presentation to the data access issue.

2.2 Instrument Status

Xiong reported that both the Aqua and Terra instruments are performing well, and both deep space maneuvers for the Terra spacecraft are on schedule. He said that he talked to the flight operations team to see if the second maneuver has been moved. They intend to keep SeaWiFS personnel informed on the second maneuver schedule. Xiong reported that they are taking measurements of m1 impacts due to the Terra MODIS Solid Diffuser Screen. MCST also did spectral measurements for Aqua, and they're not sure which lamp is the problematic one, so they're planning a test to find out. Other than that, everything is fine.

Salomonson added that Bruce Wielicki would like deep space maneuvers to happen more often, which would create a sense of stability for climate data users. Xiong said for MODIS he felt that a roll maneuver is more valuable than the deep space pitch maneuver. Esaias asked if a complete lunar model is available, and Xiong replied that no, they don't need that much information for the stability monitoring. Xiong added that the deep

space maneuver without the Moon would only be useful for the thermal emissive bands RVS, such the SST channels.

2.3 DAAC

Kempler reported that there was a problem in January 2003 with ingest that slowed the DAAC down, but it has since been fixed and the DAAC is running at 5x in reprocessing alone. Fixing the ingest problem allowed them to fix other problems at the same time, which resulted in this high reprocessing rate, and we're now well into the 2001 data. Forward processing is at 1x. Masuoka cautioned that they shouldn't go too fast, or MODAPS' disks will fill up. He suggested coordinating with Kempler. Kempler agreed. He added that if the DAAC can go fast enough, reprocessing may be able to be completed by the time Oceans is ready. Esaias asked if Oceans would be able to jump in early, and Wolfe replied that it might be possible, but that a joint MODAPS/DAAC test planed for mid- to late-March would first need to be done to demonstrate the systems are able to maintain good throughput and uncover any potential bottlenecks. Masuoka agreed, saying that if putting Oceans in early didn't affect ingest, then it may be possible. Esaias said that he would also want to look at what they would gain from jumping in early. Masuoka noted that there might also be some network transfer issues resulting from the replacement of the HIPI channel with the Gigabit Ethernet that would have to be worked out.

Kempler reported that he doesn't have a disclaimer for the Aqua Level 1 data. Xiong said that one is in the works. Kempler said that he would talk to Wolfe and Xiong next week about it.

Kempler reported that MOD 35 has a new algorithm PGE, and wanted to let users know what it is--just an approved version for the cloud mask, and is not for a new collection. Wolfe noted that as a result of the science testing Wisconsin is rethinking that fix and does not want it to go into processing. Kempler said that he's concerned because the cloud mask is used for a lot of downstream products. Wayne suggested making a note of it in the product summary. He also noted that issues like this one are the reason why the Oceans team wants to use a version numbering system so that users can see that a difference. Masuoka said that if it is a big improvement, we would want to announce it, otherwise we probably don't need to. Kempler asked how he is supposed to know when a change is big enough to announce, and Masuoka suggested speaking with someone from the Atmospheres team to find out.

2.4 MODAPS

Wolfe reported that the change to the J2000 attitude (to fix the Aqua spacecraft's attitude problem that impacts MODIS geolocation) would occur on March 5. They are also going to run a science test as soon as they have enough data available for verification.

Masuoka reported that on the issue of getting products delivered to the MODIS Direct Broadcast Receiving stations, he has someone working on it and finding out what is involved for Land and Oceans. He said that he's not clear on what version of L1B is running in direct reception, and it looks like they're getting the data from Wisconsin. This makes it hard to figure out if the data are compatible. He just wants to make sure that the right L1B is being used in direct reception, which requires that he track and understand the connection. Salomonson agreed that it is important that everyone use the

same version. Masuoka said that he's looking into this because he wants to deliver a consistent suite of Level 2s.

Masuoka reported that Bob Woodward is arranging a meeting with NOAA to make sure that they are running a compatible package of L1, L2, and higher products in the "bent pipe." He is concerned that if they are starting with L0s, it's important to make sure that everything is compatible. Kempler asked if we should tell Coronado what version of L1B to give out, and Salomonson said that that is what Masuoka is working on. Masuoka said that he's not sure how frequently it is updated.

Masuoka reported that he is going to talk with Raytheon and Ionic Enterprises, and they want to know if we are interested in making a MODIS product that could be used with GIS. Justice said that he's working on that. Masuoka said that we could adapt it for the forward stream.

Salomonson asked about new products versus standard products, and Masuoka said that the L2Gs are an improved format, not a new product. Justice noted that the validation subsets are new for community access. Johnston said that we need to figure out what we are comparing to, and Masuoka said that we also need to look at a rolling archive to see if that would solve any problems. Masuoka said that he's going to address the issue of MODAPS budget cuts, and he's also working on plans for NPP/VIIRS to give their team the benefit of our experiences with MODIS.

Johnston asked if there is still going to be a meeting about the statistics that the DAAC gave to the disciplines, and Salomonson said yes. Johnston said that she was thinking of holding it on March 3, 2003, but Masuoka suggested holding it on March 5 so that everyone has enough time to get his or her presentations submitted. Johnston agreed, and noted that in addition to making sure that we have the right set of statistics to consider, we also need to work out what we want to get from them.

Masuoka said that after we finish with reprocessing and the Data Products Review, we should decide what we want to do in Collection 5 so that he can get an idea of when it will start.

2.5 Land

Vermote reported that he had some good news to share. He selected a desert site in North Africa to use in comparing Aqua and Terra surface reflectance data. Using two years of data, he fits BDRF through surface reflectance for Terra Band 7, and got a pretty good residual of +/- 2 percent. This means that we have a really good model; all the bands are a good fit. The worst fit is on Terra Band 3, which has only slightly higher residuals. This method can be applied to predict reflectance over sites in any Terra MODIS band. When compared to Aqua MODIS, the ratio should ideally be very close to 1. On Aqua's Band 7, the ratio is indeed very close, and (starting with October 2002 data) sometimes comes within 1 percent.

Vermote said that this is good because this method doesn't rely on any ground measurements; it just needs a lot of data to measure. Wolfe asked if Aqua is relative to Terra, and Vermote said yes. Barnes asked if Aqua and Terra can be used interchangeably, and Vermote said that over the desert site, they could. In this case,

Aqua data is actually better than Terra. Justice asked about multiple instrument use, and Vermote said that this data is good enough to calculate for other instruments, meaning that MODIS is a calibration standard for Land. Salomonson noted that this shows how we are making progress is using Aqua and Terra together, and Justice noted that this is also helping to create a long-term data record.

2.6 Cryosphere

Hall, to Justice, noted that there is some inconsistency in what the different stages of validation are. Justice said that it should ideally be the PI's decision as to which stage of validation a product falls into, but clearly someone needs to coordinate. He noted that he had originally proposed specific stages in the MODIS validation definition, but finally decided that it worked better when generic. He told Hall that he would think about it, but the issue wasn't likely to be solved before the Data Products Review.

3.0 Action Items

3.1 New Action Items

None.

3.2 Old Action Items

3.2.1 King and Kempler to work together on getting ESDTs for the new Atmospheres L2 data product.
Status: Open.

3.2.2 Kempler to coordinate with Oceans group on creating documentation for the DAAC on the new Oceans L1A data subsets.
Status: Open.

3.2.3 Wolfe to contact Herring about the shopping cart feature for the Earth Observatory website.
Status: Open.

3.2.4 Tech Team to further discuss TRW using MODIS data for validation of the NPP/NPOESS production process.
Status: Open.